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### The Spring 2004 Capes Charles, Virginia Seabird Watch

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December 2004

## The Spring 2004 Cape Charles, Virginia Seabird Watch

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## Executive Summary

Migratory seabirds constitute a significant and diverse avian community within Virginia's near-shore (0-3 km) Atlantic coastal waters October-May. However, no systematic studies have been conducted to elucidate the species composition, their seasonal and daily volume or habitat utilization within this ecosystem. A full-day seabird watch was conducted, weather permitting, 14 March-13 May 2004 from the lens tower of the Cape Charles Light House, located 2 kilometers north of the southern terminus of Smith Island, Northampton County, Virginia. Monitored families included: Anatidae (seaducks) Gaviidae (loons), Podicipedidae (grebes), Pelicanidae (pelicans), Sulidae (gannet), Phalacrocoracidae (cormorants), and Laridae (skuas, jaegers, gulls, terns). 42,231 seabirds of 24 species were recorded in 261 observation hours over 46 of a possible 60 days. The distribution of species and timing of detections varied among taxa. The highest watch-day total for all species was recorded 10 April (4125 birds). The peak detections of seaducks (Harlequin Duck, Common Eider, scoters species, and Red-breasted Merganser) occurred 17-27 March, with a maximum count of 347 23-24 March. Seaducks accounted for 10% (4091) of the seabirds observed. "Dark-winged" scoter species, Surf Scoter and Black Scoter, comprised 92% (3767) of the seaduck total, and 9% of the total number of seabirds. Loons were 24% of the detected seabirds. A notable loon concentration took place 2-17 April, with a watch period high of 2566 10 April. Northern Gannets accounted for 14% (5720) of the total seabirds. Seasonal distribution of detections for this species was protracted from 26 March-9 May. Cormorants, almost exclusively Double-crested, were 40% of the seabirds detected. A definitive cormorant peak occurred 10-25 April. Gull (Laughing, Bonaparte's, Ring-billed, Herring, Lesser Black-backed, and Great Black-backed) and tern (Gull-billed, Caspian, Royal, Common, and Forster's) species comprised 5% (2172) and 4% (1810) respectively of all seabirds. 91% of all seabird detections occurred from 0700 to 1300 hours, though there was variation among the seabird families within this time distribution. 96% of all detected seabirds were within .5-2 km from shore.

## **BACKGROUND**

### **Context**

Atlantic coastal waters serve as a migration corridor and foraging resource for seabirds-seaducks, loons, grebes, pelicans, gannets, cormorants, gulls, and terns (Sibley et al 2004). Surveys of seaducks wintering along the Atlantic coast have shown major declines for the Long-tailed Duck, Black Scoter, and Surf Scoter (Perry et al 2004). Northern Gannet (Mowbray 2002) and Double-crested Cormorant (Hatch and Wesseloh 1999) populations, on the other hand, appear to be increasing. However, anthropogenic “stresses” from habitat loss/degradation, and disturbance from commercial/industrial activities, including proposed development of off shore wind turbine facilities, pose potential threats to all seabird populations.

### **Objectives**

The Barrier Island Avian Partnership recognized that the status and distribution of Virginia’s coastal marine avifauna was poorly understood as no systematic assessment of the volume of seabirds within Virginia’s coastal system or the seasonal and daily timing of their movements had been undertaken. The Partnership recommended that “Surveys of the seasonal distribution of marine birds ....be initiated to provide baseline population data for the establishment of ....management requirements” (1996).

The objectives for this study were to 1) document the spring composition and volume of the seabird species off the southern tip of the Delmarva peninsula; 2) determine the spring seasonal and daily abundance of seabirds off the southern tip of the Delmarva peninsula; and 3) determine the distance from shore the seabird families most often utilized during the spring.

## **METHODS**

### **Study Area**

The project study area was the near-shore (0-3 km) Atlantic coastal waters off the southern tip of Smith Island, Northampton County, Virginia (Figure 1). This Smith Island location is 15 km from the confluence of the Chesapeake Bay and the Atlantic Ocean. Water depth within the observation area ranges from 0-12 m.

### **Monitoring Strategy**

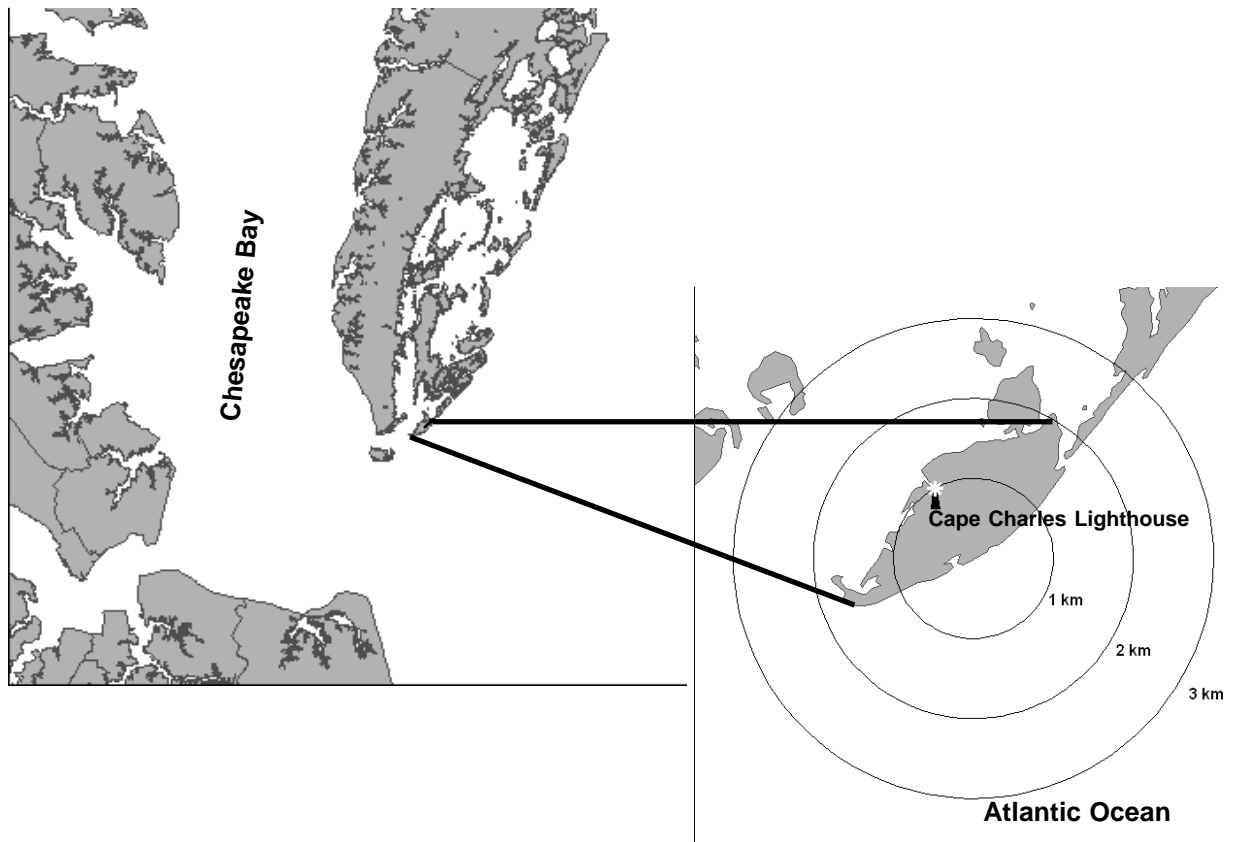
Two observers manned a daily watch from the lens tower of the 191 foot Cape Charles Light House located 2 km from the southern terminus of Smith Island from 0600-1600 hours 14 March–13 May, weather permitting. Spotting scopes and binoculars were employed to scan the open ocean waters. As birds were detected they were tabulated on a continuum. Chronological time of detection and the birds' distance from shore were recorded. Birds were identified to species if possible. In those circumstances that species identification was uncertain or undetermined, individuals were identified to genus or family. Markers were placed off shore at known distances to serve as reference points for determining distance from shore assignments.

### **Data Analysis**

All data were entered into an Excel spread sheet. For each species and/or family group an analysis of the phenology of their seasonal and daily detection, and the distance from shore they were detected was done based on the number of birds counted. The watch season was divided into 26 1-2 day intervals (Appendix 1, Table 1). No watches were conducted 15-16, 19, 28, 30-31 March, 1, 4-5, 11-13, 15, 21 April, 3 May. The count day was divided into 11 blocks commensurate with military time chronology, with a count day beginning at 0600 and ending as late as 1700 (Appendix 1, Table 2). Distance from shore was divided into 6 categories from 0->3 km (Appendix 1, Table 3).

**Figure 1**

**Cape Charles Seabird Watch Site**





## RESULTS

### Species Composition

Twenty-four seabird species were recorded during the 60-day watch (Table 1). These included 6 seaduck species, Harlequin Duck, Common Eider, Surf Scoter, White-winged Scoter, Black Scoter, and Red-breasted Merganser; 2 loon species, Red-throated and Common; Horned Grebe, Northern Gannet and Brown Pelican; 2 cormorant species, Double-crested and Great; 6 gull species, Laughing, Bonaparte's, Ring-billed, Herring, Lesser Black-backed, and Great Black-backed; 5 tern species, Gull-billed, Caspian, Royal, Common and Forster's.

Seaducks constituted 10% of the total seabirds, with Surf Scoter and Black Scoter, the "dark-winged" species, accounting for 92% of the total seaduck detections. Surf Scoters and Black Scoters were respectively <1% and 5% of the 4091 seaducks, and <1% respectively of the seabirds total. Gaviidae were 24% of the seabirds detected. Of these 5% were Red-throated Loons, 6% were Common Loons, and 89% were unidentified loon species. Grebes were <1 % of the seabirds total with 2 birds, both Horned Grebes. Northern Gannet detections comprised 14% of the seabirds total and Brown Pelicans were 2% of the seabirds total. Cormorants represented 40% of all the seabirds detected, with Double-crested Cormorants amounting to 99% of that seabird family. 5% of the seabirds total were gulls. 52% of all gulls detected were Herring Gulls, 26% were Laughing Gulls, 14% were Great Black-backed Gulls, and 1% were Ring-billed Gulls. A single Lesser Black-backed Gull was reported. Terns accounted for 4% of the total seabirds. 44% of these were unidentified to species. Royal Terns were 45%, and Forster's Terns were 10% of the documented terns. A single Gull-billed Tern was noted. Caspian and Common terns were <1% respectively of the detected terns.

### Seasonal Phenology

Tables 2 and 3 summarize the seabird species detections for each of the 26 seabird watch periods. 54% of all seabird detections occurred 2-19 April. The watch's 4 Harlequin Ducks and 3 Common Eiders were detected 17-20 March. There were no pronounced periods of seaduck abundance, though modest peaks took place 22-26 March and 16-27 April. 92% of the Red-breasted Mergansers were detected 14 March-14 April.

Loon observations began modestly, 0 to 94/2-day period, before a notable increase 2-17 April, when 72% of the total were recorded. The peak number of detections were 2-3 (2728) and 10 (2566) April.

Only 2 Horned Grebes were detected, both on 17 March.

The presence of Northern Gannets was protracted throughout the 60-day watch. From 14-29 March detections ranged from 12 to 268/2-day period. 50% (2827) of the detections were recorded 2-17 April as detections per period ranged from 196 to 931. Subsequently, through 13 May, detections ranged from 21 to 316/2-day period.

Only 13 Brown Pelicans were detected in March. Thereafter, they were most prevalent 6-29 April with count period detections ranging from 4 to 272. Subsequently, their numbers declined to 2 to 54/2-day period.

Double-crested Cormorants detections ranged from 4-107/2-day period through March. 79% (13,311) of the cormorants were recorded 2 April-1 May. 18% (3095) were recorded 2-13 May.

**Table 1. Summary of Seabird Detections for the 2004 Cape Charles Seabird Watch**

<b>Species</b>	<b>Total</b>	<b>% Seabird Total</b>	<b>% Group</b>	<b>Peak Count</b>	<b>Date</b>
Common Eider	3	<1	<1	3	3/21
Harlequin Duck	4	<1	<1	3	3/20
Surf Scoter	29	<1	<1	11	3/17
White-winged Scoter	7	<1	<1	3	4/3
Black Scoter	196	<1	5	74	4/24
“Dark-winged” Scoter sp.	3513	8	86	468	4/27
Red-breasted Merganser	339	<1	8	32	4/10
<b>All Seaducks</b>	<b>4091</b>	<b>10</b>	<b>100</b>		
Red-throated Loon	476	1	5	71	4/10
Common Loon	641	1	6	91	4/14
Loon sp.	9459	22	89	2481	4/3
<b>All Loons</b>	<b>10576</b>	<b>24</b>	<b>100</b>		
Horned Grebe	2	<1	100	2	3/17
Northern Gannet	5720	14	100	722	4/2
Brown Pelican	1028	2	100	2041	4/4
Double-crested Cormorant	16683	40	99	1798	4/17
Great Cormorant	2	<1	<1	2	3/20
Cormorant sp.	147	<1	1	81	4/2
<b>All Cormorants</b>	<b>16832</b>	<b>40</b>	<b>100</b>		
Laughing Gull	575	1	26	67	4/14
Bonaparte’s Gull	1	<1	<1	1	4/3
Ring-billed Gull	14	<1	1	9	3/18
Herring Gull	1134	3	52	68	4/14
Lesser Black-backed Gull	1	<1	<1	1	3/20
Great Black-backed Gull	309	<1	14	36	5/11
Gull sp.	138	<1	6	17	3/25
<b>All Gulls</b>	<b>2172</b>	<b>5</b>	<b>100</b>		
Gull-billed Tern	1	<1	<1	1	5/13
Caspian Tern	3	<1	<1	2	4/20
Royal Tern	813	2	45	87	4/29
Common Tern	5	<1	<1	3	4/25
Forster’s Tern	188	<1	10	26	4/17 and 23
Tern sp.	800	2	44	88	4/22
<b>All Terns</b>	<b>1810</b>	<b>4</b>	<b>100</b>		

**Table 2. Seabird Detections by Count Period**

<b>Count Period</b>	<b>Seaducks</b>	<b>Loons</b>	<b>Grebes</b>	<b>Gannets</b>	<b>Pelicans</b>	<b>Cormorants</b>	<b>Gulls</b>	<b>Terns</b>	<b>All</b>
<b>March</b>									
14	52	2	0	33	0	4	3	0	94
17/18	246	5	2	50	0	82	69	0	454
20/21	305	4	0	150	0	107	31	0	597
22/23	347	124	0	66	0	42	23	1	603
24/25	102	302	0	121	13	107	50	0	695
26/27	342	969	0	268	0	76	56	0	1711
29	70	10	0	12	0	8	8	0	108
<b>April</b>									
2/3	175	2728	0	931	13	346	155	3	4351
6/7	126	558	0	210	272	394	78	18	1656
8/9	140	1805	0	196	17	300	93	13	2564
10	121	2566	0	271	93	955	135	37	4178
14	36	362	0	487	4	1356	140	24	2409
16/17	371	828	0	732	18	2825	83	63	4920
18/19	290	59	0	149	94	1930	108	98	2728
20	81	14	0	316	81	291	31	59	873
22/23	180	16	0	311	94	751	69	271	1692
24/25	189	50	0	245	97	1998	171	277	3027
26/27	470	104	0	177	38	932	163	149	2033
28/29	99	15	0	129	64	973	100	225	1605
30/1	45	5	0	153	17	260	67	113	660
<b>May</b>									
2	33	4	0	76	2	73	64	51	303
4/5	12	20	0	180	12	1007	91	75	1397
6/7	194	4	0	140	4	707	92	55	1196
8/9	61	15	0	202	10	854	92	89	1323
10/11	0	4	0	94	31	358	140	121	748
12/13	4	3	0	21	54	96	60	68	306
<b>Totals</b>	<b>4091</b>	<b>10576</b>	<b>2</b>	<b>5720</b>	<b>1028</b>	<b>16832</b>	<b>2172</b>	<b>1810</b>	<b>42231</b>

**Table 3. Percentage of Seabirds Detected by Count Period**

<b>Count Period</b>	<b>Seaducks</b>	<b>Loons</b>	<b>Grebes</b>	<b>Gannets</b>	<b>Pelicans</b>	<b>Cormorants</b>	<b>Gulls</b>	<b>Terns</b>	<b>All</b>
<b>March</b>									
14	1	0	1	0	0	0	0	0	0
17/18	6	0	100	1	0	0	3	0	1
20/21	7	0	0	3	0	1	1	0	1
22/23	8	1	0	1	0	0	1	0	1
24/25	2	3	0	2	1	1	2	0	2
26/27	8	9	0	5	0	0	3	0	4
29	2	0	0	0	0	0	0	0	0
<b>April</b>									
2/3	4	26	0	16	1	2	7	0	10
6/7	3	5	0	4	26	2	4	1	4
8/9	3	17	0	3	2	2	4	1	6
10	3	24	0	5	9	6	6	2	10
14	1	3	0	9	0	8	6	1	6
16/17	9	8	0	13	2	17	4	3	12
18/19	7	1	0	3	9	11	5	5	6
20	2	0	0	6	8	2	1	3	2
22/23	4	0	0	5	9	4	3	15	4
24/25	5	0	0	4	9	12	8	15	7
26/27	11	1	0	3	4	6	8	8	5
28/29	2	0	0	2	6	6	5	12	4
30/1	1	0	0	3	2	2	3	6	2
<b>May</b>									
2	1	0	0	1	0	0	3	3	1
4/5	0	0	0	3	1	6	4	4	3
6/7	5	0	0	2	0	4	4	3	3
8/9	1	0	0	4	1	5	4	5	3
10/11	0	0	0	2	3	2	6	7	2
12/13	0	0	0	0	5	1	3	4	1

**Table 4. Seabird Detections by Time Block**

<b>Time Block</b>	<b>Seaducks</b>	<b>Loons</b>	<b>Grebes</b>	<b>Gannets</b>	<b>Pelicans</b>	<b>Cormorants</b>	<b>Gulls</b>	<b>Terns</b>	<b>All</b>
0600-0659	103	501	0	425	2	587	64	26	1708
0700-0759	746	2191	0	1686	56	2552	473	322	8026
0800-0859	1159	2294	0	1352	64	3939	484	357	9649
0900-0959	815	1154	0	576	111	2208	368	386	5618
1000-1059	514	846	0	781	345	3556	286	240	6568
1100-1159	457	342	0	282	203	2294	204	211	3993
1200-1259	154	2824	2	341	135	1008	167	157	4788
1300-1359	67	398	0	232	97	612	104	109	1619
1400-1459	53	14	0	25	6	53	19	2	172
1500-1559	14	11	0	10	9	19	1	0	64
1600-1659	9	1	0	10	0	4	2	0	26
<b>Totals</b>	4091	10576	2	5720	1028	16832	2172	1810	42231

**Table 5. Percentage of Seabirds Detected by Time Block**

<b>Time Block</b>	<b>Seaducks</b>	<b>Loons</b>	<b>Grebes</b>	<b>Gannets</b>	<b>Pelicans</b>	<b>Cormorants</b>	<b>Gulls</b>	<b>Terns</b>	<b>All</b>
0600-0659	3	5	0	7	0	3	3	1	4
0700-0759	18	21	0	29	5	15	22	18	19
0800-0859	28	22	0	24	6	23	22	20	23
0900-0959	20	11	0	10	11	13	17	21	13
1000-1059	13	8	0	14	34	21	13	13	16
1100-1159	11	3	0	5	20	14	9	12	9
1200-1259	4	27	100	6	13	6	8	9	11
1300-1359	2	4	0	4	9	4	5	6	4
1400-1459	1	0	0	0	1	0	1	0	0
1500-1459	0	0	0	0	1	0	0	0	0
1600-1659	0	0	0	0	0	0	0	0	0

**Table 6. Seabird Detections by Distance**

<b>Distance (km)</b>	<b>Seaducks</b>	<b>Loons</b>	<b>Grebes</b>	<b>Gannets</b>	<b>Pelicans</b>	<b>Cormorants</b>	<b>Gulls</b>	<b>Terns</b>	<b>All</b>
<b>0</b>	0	63	0	1	0	816	182	63	1125
<b>0-.25</b>	3	18	0	1	0	95	13	1	131
<b>.25-.50</b>	10	37	0	6	13	195	58	47	366
<b>.5-1.0</b>	2502	2228	2	2798	528	9884	1621	1504	21067
<b>1-2</b>	1576	8229	0	2914	486	5841	298	195	19539
<b>2-3</b>	0	1	0	0	0	1	0	0	2
<b>&gt;3</b>	0	0	0	0	1	0	0	0	1
<b>Totals</b>	4091	10576	2	5720	1028	16832	2172	1810	42231

**Table 7. Percentage of Seabirds Detected by Distance**

<b>Distance (km)</b>	<b>Seaducks</b>	<b>Loons</b>	<b>Grebes</b>	<b>Gannets</b>	<b>Pelicans</b>	<b>Cormorants</b>	<b>Gulls</b>	<b>Terns</b>	<b>All</b>
<b>0</b>	0	1	0	0	0	5	8	3	3
<b>0-.25</b>	0	0	0	0	0	1	1	0	0
<b>.25-.50</b>	0	0	0	0	1	1	3	3	1
<b>.5-1.0</b>	61	21	100	49	51	59	75	83	50
<b>1-2</b>	39	78	0	51	47	35	14	11	46
<b>2-3</b>	0	0	0	0	0	0	0	0	0
<b>&gt;3</b>	0	0	0	0	0	0	0	0	0

Gulls were present throughout the 60-day watch. March detections ranged from 3 to 61/period, before increasing into April, with no periods of concentration.

Only one tern was detected in March. Tern detections gradually increased from 2-20 April followed by a noticeable peak 22-29 April.

### **Daily Phenology**

Tables 4 and 5 summarize the daily phenology of the seabird detections by hour. 71% of the seabird detections were recorded from 0700 to 1100, 91% from 0700-1300. Few seabirds (4%) were recorded after 1300. Among the seabird families, however, there was variation. 64% of the seaducks and 54% of the loons were detected from 0700 to 1000. 77% of the Northern Gannet and 74% of the gull detections were made between 0700 to 1100. Cormorants (86%) and terns (84%) were detected 0700 to 1200.

### **Distance from Shore**

Birds detected by distance from shore showed little variation among the seabird families as summarized in Tables 6 and 7. 1125 (3%) seabirds were observed over land. Cormorants, gulls, and terns were 5%, 8%, and 3% respectively of this total. No seabirds were detected >3km from shore. 96% of all seabirds were detected .5-2.0 km from shore, including virtually all seaducks, loons, grebes, Northern Gannets and Brown Pelicans.

### **N-Pol Radar Detections**

No seabird detections were made by the N-Pol radar unit at Oyster, Virginia. At the time of this study detection calibrations for the equipment had not been fully completed.

## DISCUSSION

The near-shore Atlantic coastal waters off the southern tip of the Delmarva Peninsula are a significant migratory corridor and foraging resource for a diverse avifauna community. Twenty-four seabird species were detected during the spring 2004 Cape Charles Seabird Watch. Unlike the fall 2003 seabird watch (Williams and Paxton 2004) seaducks were not the most abundant seabirds during the spring 2004 watch. This was significant in that as many as 70,000 scoters had been counted in a single day in February along the Chesapeake Bay Bridge tunnel, approximately 25 km from the watch site, (Day and Illiff 2004). Cormorants, predominantly Double-crested, comprised 40% of the seabirds total and loons were 25% of the total. Seaducks, primarily scoters, comprised 10% of the total number of birds recorded, of which “dark-winged” scoter species, Black and Surf, accounted for 92% of the detected seaducks.

Seaduck populations are poorly understood and little researched despite the fact that populations of 13 of the 15 species of seaducks have shown marked declines (Perry et al. 2004). Further, approximately 25-35% of the Atlantic Flyway population of waterfowl winter in the Chesapeake Bay (Perry et al 2004). Given the preponderance of seaducks throughout the 2003 fall season and the aforementioned unprecedented numbers of scoters in the Chesapeake Bay just prior to the initiation of this project, it is notable that so relatively few were recorded during the spring 2004 seabird watch.

Black Scoter spring migration in eastern Canada typically peaks in mid-May (Bordage and Savard 1995). Surf Scoters depart Cape May, New Jersey in March, with increasing numbers reported off coastal New York in April (Savard et al. 1998). Evidence suggests that both species migrate over land. Along the southern tip of the Delmarva Peninsula in the spring of 2004 scoter abundance was at its maximum from mid-March through late April.

During the spring 2004 seabird watch seaducks tended to be most often detected from 0700 to 1200 hours. All of the detections were at distances of 0.5-2 km from shore.

Whereas loons comprised 5% of the seabirds detected during the fall 2003 seabird watch (Williams and Paxton 2004), they constituted 25% of the birds detected for this project. They were most often recorded between 0700 and 1000 hours. 99% of the detected loons were from 0.5-2 km off shore.

Northern Gannets represented 14% of the seabirds total, compared to 26% of the fall 2003 seabird detections (Williams and Paxton 2004). Spring migration of Northern Gannets commences by February with adults preceding younger birds at 56-112 km/day (Mowbray 2002). Their peak arrival on the breeding grounds is in mid-April. Detections for this species during spring 2004 seabird watch indicated a protracted movement throughout the watch. Northern Gannet activity extended from 0700 to 1100 hours, exclusively within 0.5-2 km from shore.

Brown Pelicans breed on Fishermans Island National Wildlife Refuge within 15 kilometers of the watch site (Williams et al 2002). This species was 2% of the seabirds total. Consistent with arrival and preparation for nesting, this species was in little evidence until the first week of April. Peak pelican activity was 0900 to 1300 hours at distances 0.5-2 km from shore.

Cormorants, predominately Double-crested, are common to abundant along the ocean and adjacent barrier island lagoon system of the Delmarva Peninsula throughout the late summer and fall (pers. observ.). Double-crested Cormorant spring migration reaches its peak off Massachusetts in late April (Hatch and Wesseloh 1999). This family was 40% of the seabirds total for this project, quite different from the 3% total of the previous fall study (Williams and Paxton 2004).



Fall cormorants showed no preference for distance from shore, being equally recorded from .25-3 km. For this spring 94% were recorded within 0.5-2 km from shore. 5% were detected over land. 2% were detected 0.25-0.5 km from shore. Among seabirds, this family was most often detected from 0700 to 1200 hours.

Laridae, especially gulls, are conspicuous on the Delmarva Peninsula throughout the year. Laughing, Herring, and Great Black-backed gulls, and Gull-billed, Royal, Common, and Forster's terns breed throughout nearby the Eastern Shore barrier islands system (Williams et al 2002, Watts et al. 2004). Ring-billed Gulls are abundant migrants to the area (Kain 1987). Collectively gulls and terns were 9% of the seabirds detected with 5% and 4% respectively. Both groups showed a preference for morning activity from 0700 to 1200 hours. Activity distance from shore ranged from 0.5-2 km. Not surprisingly terns were not in evidence in March. Throughout April they increased with a modest peak in late April. Declining numbers thereafter is an indication of dispersal for breeding activities.

## **CONCLUSIONS and RECOMMENDATIONS**

The near-shore Atlantic coastal waters off the southern terminus of Virginia's Eastern Shore Peninsula attract a significant and diverse spring seabird community. Birds are most abundant from early April through early mid- May, with some timing variation among the different avian families. Activity for most species commences by 0700 and continues to 1300 hours. Species were not detected beyond 2 km from shore, with most birds showing a preference for the waters 0.5-2 km off the beach. This latter finding is significant in view of potential off-shore wind turbine development, but it should not be considered definitive. Viewing limitations from the Cape Charles Lighthouse may have biased this preliminary conclusion.

Therefore, long-term studies on the seabird species composition, seasonal and daily phenology and habitat utilization of the near-shore waters of coastal Virginia need to be continued to establish a baseline for comparative assessments of seabird populations and how and where they are active. Studies need to begin by mid February to capture the full continuum of the seabird activity throughout the season. A watch site more easily accessible and one that is more representative of the true ocean environment should be strongly considered.

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**APPENDIX 1: 2004 Seabird Watch Date Periods, Time Blocks, and  
Distance from Shore Codes**

**Table 1: Date Periods**

Month	March									April								
Day	14	17-18	20-21	22-23	24-25	26-27	28	29	30-1	2-3	4-5	6-7	8-9	10	11-13	14	15	16-17
Period	1	2	3	4	5	6	*	7	*	8	9	*	10	11	*	12	*	13

Month	April									May						
Day	18-19	20	21	22-23	24-25	26-27	28-29	30-1	2	3	4-5	6-7	8-9	10-11	12-13	
Period	14	15	*	16	17	18	19	20	21	*	22	23	24	25	26	

\*No Watch Conducted

**Table 2: Time Blocks**

Hour	0600-0659	0700-0759	0800-0859	0900-0959	1000-1059	1100-1159	1200-1259	1300-1359	1400-1459	1500-1559	1600-1659
Block	1	2	3	4	5	6	7	8	9	10	11

**Table 3: Distance from Shore Codes**

Distance (km)	0	.25	.25-.50	.5-1.0	1-2	2-3	>3
Code	0	1	2	3	4	5	6



**APPENDIX 3:** List of Seabird Species detected during the Spring 2004 Cape Charles Seabird Watch

<b>Species</b>	<b>Scientific Name</b>
Common Eider	<i>Somateria mollissima</i>
Harlequin Duck	<i>Histrionicus histrionicus</i>
Surf Scoter	<i>Melanitta perspicillata</i>
White-winged Scoter	<i>Melanitta fusca</i>
Black Scoter	<i>Melanitta nigra</i>
Red-breasted Merganser	<i>Mergus serrator</i>
Red-throated Loon	<i>Gavia stellata</i>
Common Loon	<i>Gavia immer</i>
Horned Grebe	<i>Podiceps auritus</i>
Northern Gannet	<i>Sula bassana</i>
Brown Pelican	<i>Pelicanus occidentalis</i>
Double-crested Cormorant	<i>Phalacrocorax auritus</i>
Great Cormorant	<i>Phalacrocorax carbo</i>
Laughing Gull	<i>Larus atricilla</i>
Bonaparte's Gull	<i>Larus philadelphia</i>
Ring-billed Gull	<i>Larus delawarensis</i>
Herring Gull	<i>Larus argentatus</i>
Lesser Black-backed Gull	<i>Larus fuscus</i>
Great Black-backed Gull	<i>Larus marinus</i>
Gull-billed Tern	<i>Sterna nilotica</i>
Caspian Tern	<i>Sterna caspia</i>
Royal Tern	<i>Sterna maxima</i>
Common Tern	<i>Sterna hirundo</i>
Forster's Tern	<i>Sterna forsteri</i>



